CLAIMS

What is claimed is:

1. A method of reconstructing cross-sectional images of an object from radiographic images of the object, said method comprising:

receiving pixels of a radiographic image of an object at an image reconstruction processor that is operable to process said received pixels to reconstruct cross-sectional images of said object, wherein said processing by said image reconstruction processor is independent of the order in which said pixels are received;

for at least a first received pixel, said image reconstruction processor determining a plurality of voxels to which said at least a first received pixel contributes; and

said image reconstruction processor applying a contribution of said at least a first pixel to said plurality of voxels in parallel.

2. The method of claim 1 further comprising:

for each received pixel, said image reconstruction processor determining a plurality of voxels to which the received pixel contributes, and said image reconstruction processor applying a contribution of the received pixel to said plurality of voxels to which the received pixel contributes in parallel.

3. The method of claim 1 wherein said plurality of voxels comprises:

a first voxel of a first layer of said object and a second voxel of a second layer of said object.

4. The method of claim 1 further comprising:

receiving position data and using said position data for said determining said plurality of voxels.

5. The method of claim 4 wherein said position data comprises at least one selected from the group consisting of: pixel position data and X-ray spot position data.

6. The method of claim 1 wherein said object comprises a circuit board.

7. The method of claim 1 wherein said radiographic image comprises an X-ray image.

8. The method of claim 1 wherein said applying a contribution of said at least one pixel to said plurality of voxels in parallel further comprises:

retrieving said plurality of voxels from memory;

applying a contribution of said at least one pixel to said plurality of voxels; and

writing said plurality of voxels as modified by said contribution of said at least one pixel to said memory.

9. The method of claim 8 wherein said applying contribution of said at least one pixel to said plurality of voxels comprises:

using a backprojection-based algorithm.

10. The method of claim 8 wherein said applying contribution of said at least one pixel to said plurality of voxels comprises using one selected from the group consisting of:

Back Projection technique, shift-and-add technique, and averaging technique.

11. A method of reconstructing cross-sectional images of an object from radiographic images of the object, said method comprising:

receiving at least one pixel of a radiographic image of an object at an image reconstruction processor;

receiving associated position data for the at least one pixel at said image reconstruction processor;

said image reconstruction processor determining, based at least in part on said received position data, a first voxel of a first layer of said object to which said at least one pixel contributes,

said image reconstruction processor determining, based at least in part on said received position data, a second voxel of a second layer of said object to which said at least one pixel contributes; and

said image reconstruction processor applying the respective contribution of said at least one pixel to said first voxel and said second voxel in parallel.

12. The method of claim 11 comprising:

receiving a plurality of pixels of said radiographic image at said image reconstruction processor;

receiving associated position data for each of said plurality of pixels at said image reconstruction processor;

said image reconstruction processor determining for each of said plurality of pixels, based at least in part on said received position data associated with the pixel, a first voxel of a first layer of said object to which the pixel contributes,

said image reconstruction processor determining for each of said plurality of pixels, based at least in part on said received position data associated with the pixel, a second voxel of a second layer of said object to which the pixel contributes; and

for each of said plurality of pixels, said image reconstruction processor applying the determined contribution of the pixel to said first voxel and said second voxel in parallel.

13. The method of claim 11 wherein said associated position data comprises at least one selected from the group consisting of: pixel position data and X-ray spot position data.

14. The method of claim 11 wherein said image reconstruction processor applying the respective contribution of said at least one pixel to said first voxel and said second voxel in parallel further comprises:

retrieving said first and second voxels from memory;

applying the determined contribution of said at least one pixel to said first and second voxels; and

writing said first and second voxels as modified by said contribution of said at least one pixel to said memory.

15. The method of claim 11 wherein said image reconstruction processor applying the respective contribution of said at least one pixel to said first voxel and said second voxel in parallel comprises:

using a backprojection-based algorithm.

16. A reconstruction processor comprising:

at least one input port for receiving pixels of a radiographic image of an object;

at least one input port for receiving position data associated with a received pixel;

image processing logic operable to determine, based at least in part on said received position data of a received pixel, a first voxel of a first layer of said object and a second voxel of a second layer of said object to which said received pixel contributes, and

said image processing logic operable to apply the respective contribution of said received pixel to said first voxel and said second voxel in parallel.

17. The reconstruction processor of claim 16 further comprising:

a first memory communicatively coupled thereto for storing voxels for said first layer of said object; and

a second memory communicatively coupled thereto for storing voxels for said second layer of said object.

18. The reconstruction processor of claim 17 wherein said at least one input port for receiving position data comprises:

at least one input port for receiving data identifying a depth coordinate for said first layer of said object; and

at least one input port for receiving data identifying a depth coordinate for said second layer of said object.

19. The reconstruction processor of claim 17 wherein said image processing logic comprises:

at least one input port for retrieving said first voxel from said first memory; and

at least one input port for retrieving said second voxel from said second memory.

20. The reconstruction processor claim 19 wherein said image processing logic comprises:

at least one output port for writing said first voxel having said respective contribution of said received pixel applied thereto to said first memory; and

at least one output port for writing said second voxel having said respective contribution of said received pixel applied thereto to said second memory.

21. The reconstruction processor of claim 16 wherein said image processing logic comprises a backprojection-based algorithm for applying said respective contribution of said received pixel to said first voxel and said second voxel.

22. A system for reconstructing cross-sectional images of an object from radiographic images of the object, said system comprising:

means for capturing pixels of an object, wherein said means for capturing comprises a non-contiguous sensor arrangement; and

means for processing a pixel captured by the capturing means to reconstruct multiple layers of said object in parallel.

23. The system of claim 22 wherein the processing means applies the contribution of said pixel captured by the capturing means to a plurality of voxels in parallel.

24. The system of claim 23 wherein said plurality of voxels comprise voxels of different layers of said object.